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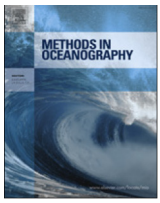

Full length article

To sea and to see: That is the answer

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ABSTRACT

In this article Dr. Jules S. Jaffe chronicles his development as a scientist and engineer. The story starts during his middle school years and continues up until the present day. Dr. Jaffe, as an inventor of technology for ocean exploration has played a role in a number of advances in ocean engineering. These range from the development of a planar laser imaging system for sensing fluorescent microstructure to swarms of underwater autonomous floats, to a current generation of underwater microscopes. The emphasis of the article is on career development and the process rather than the exact, and detailed, documentation of technology. Dr. Jaffe is also the Editor in Chief of Methods in Oceanography and he instituted these autobiographies for exactly this purpose: To give younger, aspiring, professionals an example of a career that has not been "straight through", but rather a meandering path through a multitude of projects, proposals, and relationships with colleagues, students, and funding agencies.

1. Introduction

In this issue I am honored to play the dual roles of both Editor-in-Chief of Methods in Oceanography and the autobiographer, and relate my career development and its evolution in the context of both the creation of this journal and my career as a scientist/engineer. Throughout my career, my primary goal has been to develop new technologies and implement them in the undersea world. With many thanks to the co-editors of this special issue—David Kriegman (UCSD), Ben Richards (U Hawaii),

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and Hanu Singh (Northeastern U)—I will now embark on a summary of my career highlights, my motivations, and what I imagine my future work in ocean engineering might entail. No doubt, one of the most difficult decisions in writing an autobiography is where to start and how much detail to include.

To begin with, my motivation arises from a desire to explore the oceans via the development of new "Methods". However, how one arrives at the goal of having a group that works on the creation of new technological "feats" is a story in itself. In my career, I have always been torn between a desire to be logically inquisitive and, on the other hand, to create a physical realization of a creative process of design. The former could be considered scientific discovery and algorithm development, while the latter is either art or engineering. The history of logical inquiry and its use in pure thought and the description of the natural world is a great story: we scientists and engineers are all benefactors of the ancient Euclideans who bridged the gulf between geometry and its manifestation as both art and science. Perhaps they were motivated by simple tasks such as computing areas and defining property lines. However, my own opinion is that there is a deeper, more spiritual feeling that one gets when the harmony of math is combined with its realization in the modern world. This encompasses both art and music as they both have their roots in physics, logic, and perception. After all, "We are what we sense". As an example, I continue to be fascinated with the solid forms called Platonic solids. When I view those shapes and think about their mathematical theory, they create a natural and transcendent harmony in my mind.

In creating a chronicle of my personal development, an interest in intellectual pursuits was manifest at an early age. In middle school, for example, I became very interested in "the mind" and deciphering aspects of thinking. My vehicle was hypnosis, to which I subjected a variety of friends and acquaintances to explore the veneer of consciousness and what lies below as revealed by hypnotic inquiry. At about the same time that I almost was thrown out of summer camp for hypnotizing a particularly somnambulistic camper, I became disillusioned with that the stories that my subjects told about their previous lives were fantasy. Nevertheless, when I was a physics/art history major/minor at the University of Buffalo, I became aware of a guiding light, Warren McCulloch (a famous brain science pioneer), who asked: "What is a number that man may know it and what is a man that he may know a number" (McCulloch, 1965). This is, no doubt, the most interesting question that one can ask, but we might not ever have an answer; or maybe we will get one in one thousand years!

In my role as both a teacher and mentor, I try to relate that in my own career I was not much of a "straight-though-guy". My high school years were mostly consumed with performing and music; science and math played a less important role. This was partly due to my transferring from one school district to another and my being put into the "normal" kid classes in contrast to those of the "talented and gifted" kids. I still remember the face of my geometry teacher who asked me, "What are you dong in this class?" upon handing me back a test on which I scored 100%. "We moved here recently", I told her. "Hmm", she said, "You should have asked to get into the accelerated classes". However, although I was in the wrong place intellectually, it gave me lots of time to pursue other interests such as being a lead singer in a rock 'n' roll band, and directing and having the lead role in a number of theatrical productions. No doubt, I am the only oceanographer who got to jam with Bo Diddley! As my dad had recently died we did not have much money, so I held down a part time job as well. This generated some income and responsibility that played a constructive role in my development. What I emphasize to my students is that each of us has the option of forging a career and lifestyle that can take advantage of our talents. I think that we all regard the more accomplished folks we know as having taken a straight path from birth to where they are now. It is simply not so.

As an example, in my career now, I believe that I am regarded as giving excellent presentations. During 2014 I appeared on international TV news (CNN) several times. This evolved first from a computer/video interview to my eventually co-hosting, in person, an episode of a news talk show. I have no doubt that my experience in performing played a role in these successes. In addition, a wonderful aspect of career development in the United States is that our aspirations are not necessarily thwarted due to age, but rather, given motivation and time, we can continue to explore new options, even as we get older. For example, I started this journal! My message is clear: go for it!

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